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Description

Drive

The invention relates to a drive having the features of the preamble of claim 1.

Drives which are provided for operating adjusting parts of an armature, in particular of a valve, are generally known.

The object of the invention is to further develop a drive having the features of the preamble of claim 1 such that a small-sized unit with high efficiency is obtained.

According to the invention, this object is solved by the characterizing features of claim 1.

Advantageous embodiments and further developments of the invention are characterized by the features of the subclaims.

Further advantages and essential particulars of the invention can be found in the following description and the drawings which show preferred embodiments in a schematic representation by way of example, namely:

FIG. 1 a drive according to the invention in a sectional side view, and

FIG. 2 another drive according to the invention in a sectional side view.

The drive 1 shown in FIG. 1 has a housing 2 which is fastened to a body 3 of a valve 4. For this purpose, the body 3 has a recess in which the housing 2 can be secured in the region of a lower end wall 5, e.g. via a thread. In the region of the recess, there is an opening 6 which is covered by the end wall 5. A seal 8 is provided between the end wall 5 and the base 7 of the recess.

The valve 4, which can be flowed through by a medium in direction of the arrow, has a valve seat 9 that can be closed via a sealing element 11 disposed on an adjusting part 10, so that the flow of the medium is stopped. In the open position shown, the disk-shaped sealing element 11 is at a distance above the valve seat 9 in the region of the opening 6.

Preferably, the compact, essentially tubular or cylindrical housing 2 is arranged with its axis 12 in the right angle to the longitudinal axis of the valve 4.

An electrically operated motor 13 is located in the upper part of the housing 2, the periphery of said motor being fastened to the inner side of the housing 2 and the one front end of which is mounted on a stop 14 of the housing 2, as a result of which the motor 13 is firmly secured in the housing 2, both radially and axially.

A coupling 16, arranged on the shaft 15, is provided on the front end of the motor 13 pointing downward in the drawing, said coupling 16 having a downward extending coupling pin 17. The coupling pin 17 can be polygonal in cross section, preferably hexagonal.

In the lower half of the housing 2, an epicyclic threaded spindle 18 used as a gear is provided with a gear housing which is secured with its periphery on the inside of the housing 2 and mounted with its downward directed front end on a protrusion 20 of the housing 2. A disk-shaped limit 21, which is held in the grooves 22 of the housing 2, is situated on the opposite upper front end of the gear housing 19. In this way, the gear housing 19 is secured against torsion and axial displacement in the housing 2.

The epicyclic threaded spindle 18 has a spindle 24 provided with an outer thread 23, said spindle having an upward extending drive part 25 and a downward directed output part 26. A blind hole is formed in the longitudinal direction of the drive part 25, the cross section of which corresponds to that of the coupling pin 17 which is securely mounted in the blind hole. The drive part 25 is axially displaceable on the coupling pin 17.

The output part 26 passes through a seal ring 27 which is mounted in the end wall 5 of the housing 2 and tightly encloses the output part 26. The adjusting part 10 carrying the sealing element 11 is pivoted on the end part 28 of the output part 26 protruding from the end wall 5. The spindle 24 is mounted in the gear housing 19 between rollers which surround the spindle 24. The rollers can be mounted in the gear housing 19 parallel to the axis 12 of the spindle 24 and have peripheral threads which engage in the thread 23 of the spindle 24.

As can be seen in the drawing, the motor 13 with the shaft 15, the coupling 16, the gear housing 19 and the spindle 24 with the drive part 25 and the output part 26 are aligned coaxially to the axis 12 of the housing 2, so that a slender and small-sized drive unit is given. Moreover, the drawing discloses a preferred contact-free odometer system which can have two sensors 29, 30 that are provided

on the outer peripheral area of the drive part 25 and are spaced from one another. With this odometer system, the axial displacement of the spindle 24 and with it the lift of the sealing element 11 can be measured and/or controlled relative to the valve seat 9.

Rectangular plug pins 32, 33 can be provided on an upper side wall 31 of the housing 2 for the electric connection of the motor 13. A line-connecting element 35 housing the end of an electric cable 34 can be placed on these plug pins 32, 33. In addition, it can be advantageous to provide an adapter 36 between the drive housing 2 and the line-connecting element 35, said adapter can be arranged in the electronic components for the valve-control mechanism. The adapter 36 is placed on the plug pins 32, 33 and has, on the opposite side, similarly designed plug tongues 37, 38 on which the line-connecting element 35 can be placed.

The present embodiment represents a motor valve which is provided with a linear drive and can be used as proportional valve, shutoff valve or regulating valve. The valve 4 can be closed in the currentless state. By actuating the motor 13, the rotation of the shaft 15 is transmitted to the spindle 24 which, due to the gear function, is simultaneously axially displaced, so that the sealing element 11 of the adjusting part 10 presses against the valve seat 9 or is lifted from it. The displacement speed of the spindle 24 can be determined by the thread pitch of the epicyclic threaded spindle 18 and the rotational speed of the motor 13. The displacement path of the spindle 24 can advantageously be set such that the ratio of the volume current of the medium is proportional.

Essential advantages of the invention are that individual parts are eliminated and required space saved with simple means and that a cost-efficient manufacture and improved functionality are obtained.

The valve 4 can be finely regulated in an infinitely variable manner. Interfering pressure excesses and pressure impacts of the medium are prevented by the possibility of the defined opening and closing of the valve 4. The epicyclic threaded spindle 18 functions with very low friction and has a high efficiency. High security and resistance to impact and other outer influences are given by the complete arrangement of the drive 1 in the compact housing 2, which can consist of plastic or metal.

The embodiment shown in FIG. 2 is designed similar to the previously described embodiment of FIG. 1; for this reason, the same parts have the same reference numbers and are not described separately to avoid repetitions. However, there is a difference in that no coupling pin engaging in the drive part 39 of the spindle 40 is provided, but that the shaft 15 of the motor 13 is coupled with the gear housing 42 of the epicyclic threaded spindle 43 via a e.g. bow-shaped or cup-shaped coupling 41. Accordingly, the gear housing 42 is pivoted in the housing 2 of the drive 1. On the other hand, the output part 44 of the spindle 40 is protected against torsion via a disk-shaped abutment 45 held on the housing 2, so that the spindle 40 is axially displaceable by turning the gear housing 42. Advantageously, the adjusting part 46 and the sealing element 47 can thereby be secured so as to be untwistable on the lower end of the output part 44. The odometer system with the sensors 29, 30 mutually spaced from one another is situated on the outer peripheral area of the output part 44 in this embodiment.

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Claims

1. A drive for an armature, in particular a valve, comprising a motor, a gear and an adjusting part, characterized in that the gear is in the form of an epicyclic threaded spindle (18, 43) such that the rotary motion of a shaft (15) of the motor (13) can be transformed into an axial movement of the adjusting part (10, 46).

2. The drive according to the preceding claim, characterized in that the epicyclic threaded spindle (18, 43) has a gear housing (19, 42) in which a spindle (24, 40) is mounted between rollers which are mounted in the gear housing (19, 42) and engage in a thread (23) of the spindle (24, 40) with peripheral threads.

3. The drive according to one or more of the preceding claims, characterized in that the spindle (24, 40) has a drive part (25, 39) and an output part (26, 44) coupled with the adjusting part (10, 46).

4. The drive according to one or more of the preceding claims, characterized in that the shaft (15) of the motor (13) and the spindle (24, 40) are arranged coaxially with the drive part (25, 39) and the output part (26, 44).

5. The drive according to one or more of the preceding claims,

characterized in that the drive part (25) of the spindle (24) is coupled with the shaft (15) of the motor (13) and the gear housing (19) is secured against torsion and axial displacement.

6. The drive according to one or more of the preceding claims, characterized in that a coupling pin (17) allocated to the shaft (15) engages in a blind hole of the drive part (25) which is axially displaceable on the coupling pin (17) to transmit the rotary motion.

7. The drive according to one or more of the preceding claims, characterized in that the gear housing (42) is coupled with the shaft (15) of the motor (13) and the spindle (40) is secured against torsion.

8. The drive according to one or more of the preceding claims, characterized in that the motor (13), the epicyclic threaded spindle (18, 43), the gear housing (19, 42) and the drive part (25, 39) and the output part (26, 44) are mounted in a housing (2).

9. The drive according to one or more of the preceding claims, characterized in that the housing (2) is fastened to a body (3) of the armature (4).

10. The drive according to one or more of the preceding claims, characterized in that the output part (26, 44) of the spindle (24, 40) pass through an end wall (5) of the housing (2) and is connected with the adjusting part (10) outside of the housing (2).

11. The drive according to one or more of the preceding claims,

characterized in that a sealing ring (27) encompassing the output part (26, 44) is provided in the end wall (5) of the housing (2).

12. The drive according to one or more of the preceding claims, characterized in that the adjusting part (10, 46) has a sealing element (11, 47) and is displaceable with it against a valve seat (9).

13. The drive according to one or more of the preceding claims, characterized in that the adjusting part (10) is pivoted with the sealing element (11) on the output part (26).

14. The drive according to one or more of the preceding claims, characterized in that the adjusting part (46) is non-pivotable with the sealing element (47) on the output part (44).

15. The drive according to one or more of the preceding claims, characterized in that at least one sensor (29, 30) allocated to the drive part (25, 39) and/or the output part (26, 44) is provided for measuring and/or controlling the height of lift.

16. The drive according to one or more of the preceding claims, characterized in that plug pins (32, 33) provided on a side wall (31) of the housing (2) are allocated to the motor (13) for an electric connection.

17. The drive according to one or more of the preceding claims, characterized in that an adapter containing an electronic component is provided between the housing (2) and an attachable line-connecting element.

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FIG. 1

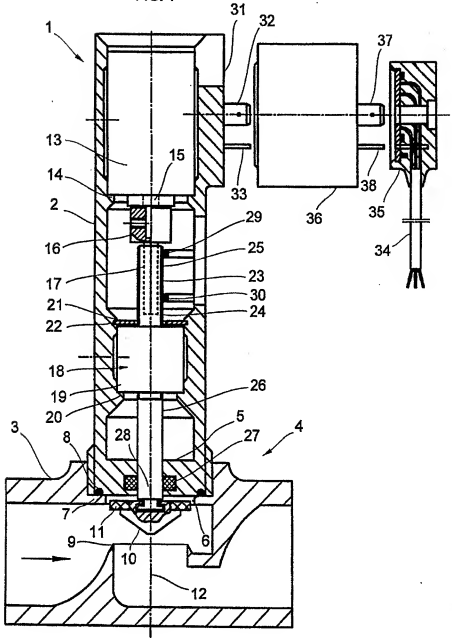
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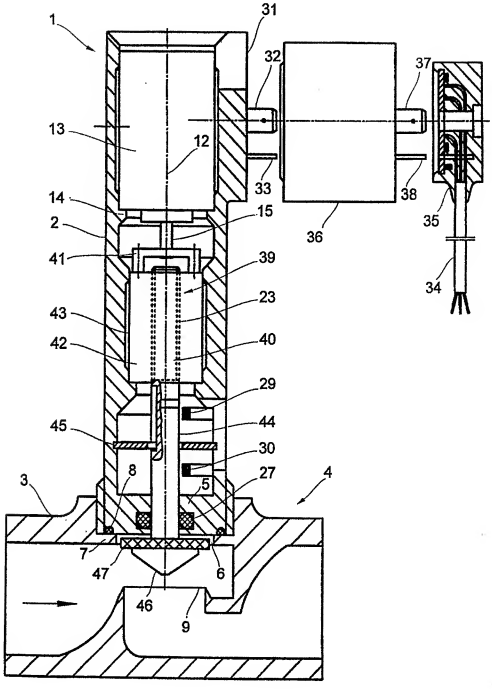
FIG. 2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